Wireless sensor networks coordinator—IEEE 802.15.4 & Ethernet
Outdoor & Rugged Version

Technical note

[TN_RF_009 – « BeanGateway® management on LAN infrastructure »](#)

IEEE 802.15.4 wireless protocol coming with antenna diversity technology

Ethernet/LAN connectivity

Advanced uninterruptible power supply with integrated rechargeable Lithium

Data logger on Micro-SD

Related Video

[Click here to see the video of the BeanGateway® (Outdoor version)](#)

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Applications

- Remote sites (solar & wind energy farm, water/gas pipeline, mountains, water power plant …)
- WSN in Harsh Industrial Environment
- Embedded measurement

Rethinking Sensing Technology

Main Features

- Builds and manages a Wireless Sensor Network (WSN) designed by **Beanair®**
- Wireless protocol stack : **IEEE 802.15.4**
- Excellent radio link relying on the radio antenna diversity developed by Beanair®
- Link protocol with a server: TCP/IP/UDP/DNS/DHCP
- Maximum Radio range : *1 km (L.O.S.)*
- Embedded WSN Diagnostic tool
- Advanced *UPS* (Uninterruptible power supply) with integrated rechargeable Lithium battery
- Watertight (IP67) & Robust Aluminium Enclosure
- WSN mapping & context is stored on embedded flash
- **« Plug & Play »** installation : no knowledge regarding wireless network is necessary
- Embedded files system for logging all the wireless sensors measurement (backup on **MicroSD**®)
- Standard interface with our WSN Scada supervision software *BeanScape®*

Multi-protocol wireless sensor networks coordinator

The *BeanGateway® Ethernet* is used to build and manage Beanair® wireless sensor network. It can manage queues for every network element (*BeanDevice®*). As a gateway, it controls the external access to the network through a highly secured authentication procedure. It supports the conversion of data exchanged, compression and IP connectivity with the network thereby reducing the intelligence required in these platforms, maintenance and therefore the associated cost.

The *BeanGateway® Ethernet* is also equipped with various communication interfaces with the customers IT infrastructure (RS232, Ethernet - TCP / IP / UDP / DHCP / DNS). With a client application TCP / IP, it can easily connect to a local application server (via the Ethernet) .
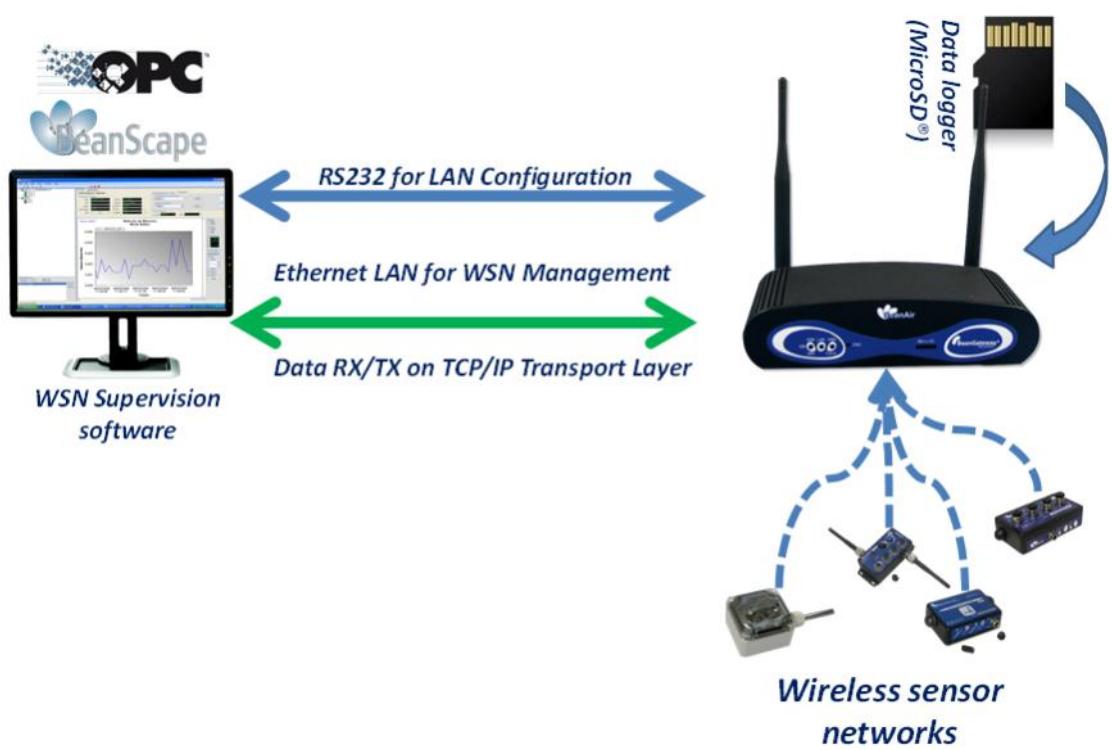
Advanced uninterruptible power supply (UPS)

The *BeanGateway® Ethernet* operates with an external power supply (DC 8-28V). An integrated rechargeable battery with a capacity of 950mAh is used as an UPS battery (uninterruptible power supply). The internal battery provides instantaneous protection from external power supply interruptions, the wireless sensor network activity & Ethernet LAN activity are maintained during this time (3h00 to 3h30 approximately).

The BeanGateway® switches automatically on its internal battery

External Power supply fails down

LAN activity is maintained

WSN activity is maintained

**BeanScape**

WSN Supervision software
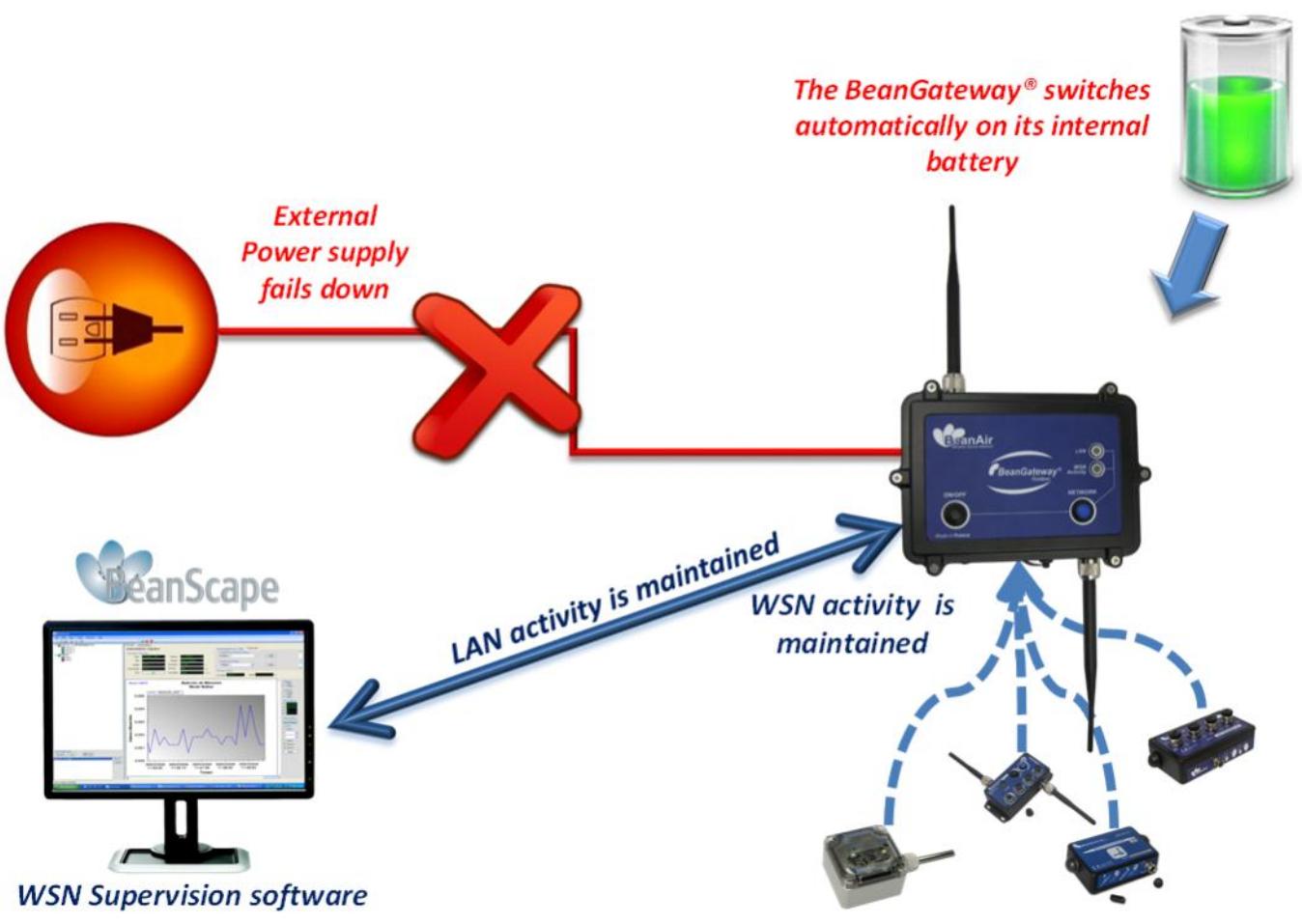
Data logger on Micro-SD (option)

The **BeanGateway® Ethernet** has the capability to backup the WSN mapping & context. Thus the user can operate the WSN without any use of PC or IT server. All the data measurements are stored on an external Memory (Micro-SD® card) .

Advanced WSN Diagnostic Tool
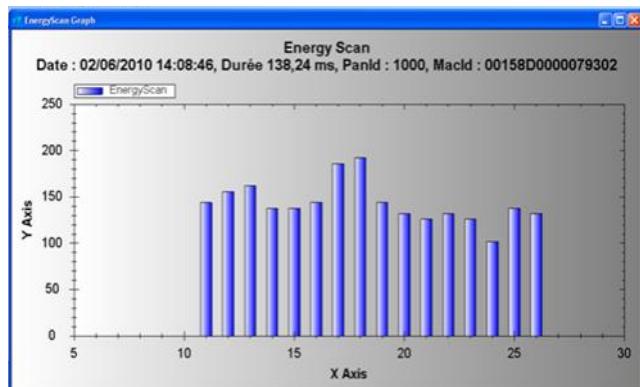
The **BeanGateway® Ethernet** provides a WSN diagnostic tool useful for resolving some common networking troubleshooting:

- **Energy Scan** for choosing the more appropriate RF Channel
- **BeanDevice® PER (Packet Error Rate)** calculation
- **LQI (Link Quality Indicator)** between the **BeanGateway® Ethernet** and the **BeanDevice®**

The Energy Scan allows the user to know the network quality on each Radio channel. This operation allows the user to choose the appropriate RF channel on a site where the WSN is deployed.

Antenna Diversity
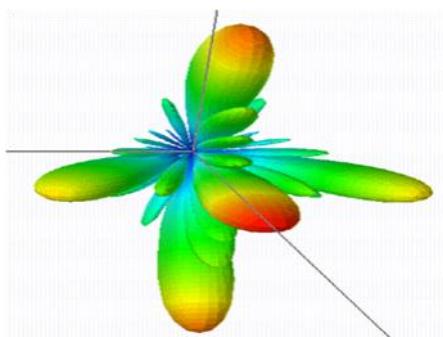
While the vast majority of wireless sensors shows their limits in harsh industrial environment, the **BeanGateway® Ethernet** integrates an innovative antenna diversity design, allowing to optimize the radio link quality in environments subject to random and diverse disturbance. Antenna diversity improves both the quality and reliability of a wireless link by 30%.

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Product reference
BGTW-ETH-OUT

Specifications	Wireless Sensor Network Coordinator	
Wireless Stack	IEEE 802.15.4	
WSN Topology	**IEEE 802.15.4**	Peer-to-peer/ Star
Antenna Diversity	Self-managed antenna diversity function	
Data rate	250 Kbits/s	
RF Characteristics	ISM 2.4GHz – 16 Channels	
RF Transmit power	Configurable transmit power: +0,5 dBm to +20 dBm	
Receiver sensitivity	-95,5 dBm to -101 dBm	
Encryption	AES 128 bits (integrated AES coprocessor)	
Maximum Radio Range	1 km (L.O.S.)	
WSN Diagnostic tool	· Energy Scan for choosing a suitable RF Channel · BeanDevice® PER (Packet Error Rate) calculation · LQI (Link Quality Indicator) between the BeanGateway® GSM/GPRS and the BeanDevice® · RF channels Blacklist	

Specifications	Ethernet/LAN Network
Network/Transport Protocol	Client TCP/IP, UDP, DNS, DHCP
Data Link Protocol	Ethernet / Fast-Ethernet with auto-uplink (MDI/MDI-X auto) - IEEE 802.3x
IP Addressing	Dynamic (DHCP) or static
IP configuration	LAN parameters (DNS, DHCP, Keep Alive…) are configurable from the BeanScape® (RS232 Interface or UDP/Ethernet Interface).

Specifications	Physical & Environmental
Dimensions (L x l x h)	202 mm x142 mm x 55 mm
Enclosure/Finish	· Aluminium alloy ADC12 black finish · Wall mounting holes (outside the sealing area)
IP Ratings	IP67
Weight	1220g
Connectors	· Power supply connector: M8-3P female socket, Ratings IP67, Contact brass with gold plated · Ethernet connector : RJ45 Female, Ratings IP67, Contact copper alloy with gold plated · Antenna connector: N-Type female, Ratings IP67 · ON/OFF push button : Latching push-button, Ratings IP67 · Network context push button: momentary push-button, Ratings IP67
Operating temperature	-20 °C to +75 °C – with Integrated internal temperature sensor (resolution 0.125°C)
Norms	CE Labeling directive R&TTE (Radio) , ETSI EN 300 328 , ROHS - Directive 2002/95/EC, FCC Part 15

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Specifications	Power Supply
Power Consumption	250 mA to 300 mA during wireless RX/TX and Ethernet activated
External power supply	+9V to +28 V , integrated Lithium-Ion battery charger with high-precision battery monitoring
Integrated Lithium-Ion Battery	Lithium-Ion rechargeable battery 950 mAh (reference BAT0.95DMG) In case of external power supply failure, the BeanGateway® can switch on the internal battery.

Specifications	Accessories
2.4 GHz Antennas	Two antennas : · High gain antenna 5,5 dBi · V.S.W.R : 1.5 :1 · Connector : N-Type (Watertight)
Ethernet Cable	· RJ45 Male waterproof connector (casing side only) · Cable length: 3 meters
Wall plug-in power supply	Wall plug-in, Switchmode power Supply 12V @ 1,25A
Connectors cap	M8-3P cap

Specifications	Options
Embedded File System on Micro-SD®	All the User data are stored on an external memory (Micro-SD® technology): · Measurement storage for Wireless Sensor Network (network configuration, measurement, alarms notifications …) ; · Maximum storage capacity (2Go) · CSV files management (for exporting data on Excel® and Access®)

Product specifications are subject to change without notice. Contact Beanair for latest specifications.

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